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Farmer Joe Duncan watched a demonstration of individual sprayer controls at the University of Kentucky's College of Agriculture Field Day in Princeton. Better control of herbicide sprayers could save money and help the environment.

UK promotes fine-tuning herbicide application

By Gregory A. Hall
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The Courier-Journal

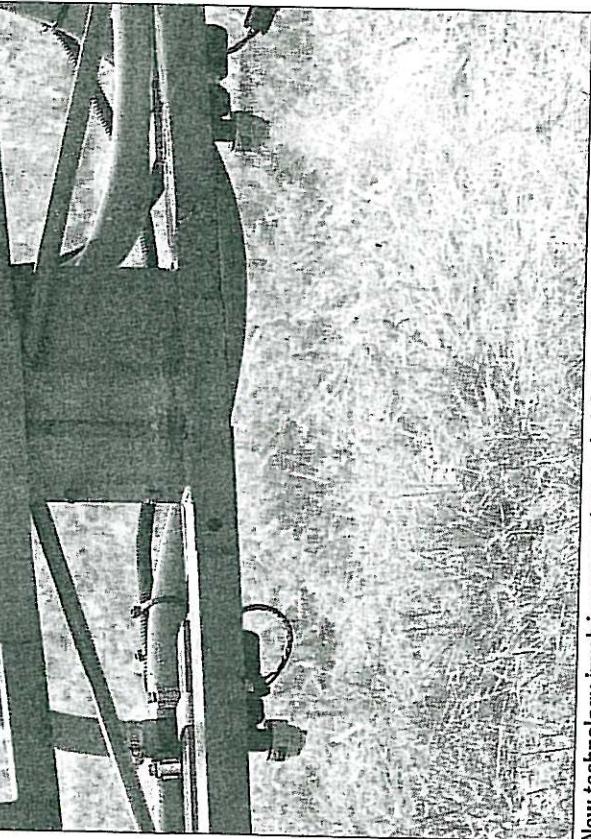
PRINCETON, Ky. — The historically inexact science of applying herbicides to crop fields is getting more precise and less expensive as recent technology allows individual nozzles on sprayers to be activated and shut off by computer.

Scott Shearer, a University of Kentucky biosystems and agricultural engineering professor, demonstrated nozzle controls last week that use global-positioning system information to eliminate overlaps as sprayers with 90-foot-wide booms pass through Kentucky's often oddly shaped fields.

While most existing boom controls shut off sections of the sprayer, the technology being promoted by UK allows individual nozzles to be turned on and off.

"We don't have the perfect rectangular-shaped fields like they have up in the Midwest," said Bowling Green farmer Joe Duncan, who watched a demonstration during the College of Agriculture's Field Day on Thursday. "We've got so many point rows, you know, odd-shaped fields, that a lot of times, especially these herbicides ... can be damaging to crops at high levels."

With wide-boom sprayers, the



New technology involving computers and global positioning systems allows for turning individual sprayers on and off, not just sections of sprayers.

Shearer said the technology has environmental benefits by better keeping herbicides out of waterways in farm fields and conservation areas.

Shearer saw the technology in action in Iowa and replicated it here, where it has been used by one family of farmers in Shelby and Henry counties, the Ellises, the last two years.

See SPRAY, D6, col. 1

Besides saving money on chem-

SPRAY | Herbicide use can be fine-tuned

Continued from D1

Initially just used for sprayers, the technology also was used to plant seed this year, Shearer said, and could be used in the future to apply nitrogen to fields.

About a half-dozen Kentucky farmers are using similar technology, he said, adding that it could become more commonplace.

Traditional sprayer controls have been manual, with a farmer turning sections of the boom on and off from the cab, Shearer said. A boom with 48 nozzles typically could have controls for five sections — with the newest having the ability to control 10 sections.

The sprayers that UK is promoting use a computer in the cab with GPS mapping to determine which nozzles are open and which are shut off at any given point. The technology allows for 30 controls, so some of the inner nozzles on a 48-nozzle sprayer are grouped.

Depending on the type of GPS system used, the accuracy can be anywhere from several inches to a few centimeters, Shearer said.

For the Ellises, it cost about \$20,000 to retrofit their 48-nozzle sprayer. Shearer said the base cost does not include the GPS.

With the ability to govern 30 nozzles or groupings at a time, each of the outer six nozzles is individually controlled. The inner 36 nozzles are paired on the other 18 controls, Shearer said because the variations in spraying are most likely to be needed at the outer edges of the path.

The Ellises said the technology paid for itself in about a year and a half because they didn't have to buy as much herbicide and wasted less of it. It also helps promote harmony with the nearly 40 landlords on whose 5,700 acres they raise corn and soybeans.

"People like to keep their waterways grassed, so it's better for landlord relations," Jim Ellis said.

For example, Mike Ellis credited the technology with avoiding a bad situation in a sunflower patch that a landlord moved. A sprayer operator — who didn't know about a sunflower patch's move — didn't spray it because the field had been mapped beforehand and the computer shut off the nozzles as the sprayer went by the patch.

It also makes it easier to avoid the waterways, said Matthew McClure, a sprayer operator for the Ellis family.

"Usually what we do is we'll spray up to the waterway, reached at (302) 582-4087."

stop, do a 90-degree turn, and then start spraying up the waterway — around it, back down it — and then have to do another 90-degree turn to start on the boundary again," he said. "And now what we can do is just drive straight across the waterway and it'll automatically shut itself off."

"Not only is it saving money for the farmers, but it's also preserving environmental quality," Shearer said.

Shearer said UK is working on improvements that could control the nozzles with microchips, reducing the amount of wiring needed to operate the individual sprayer controls.

Also, a system is being developed to improve the evenness of the chemical application. With each nozzle putting out the same amount of herbicide, the outer edges receive less chemical if the sprayer is turning, he said.

"If you don't get the right rate on, you've wasted that chemical," Shearer said.

What is being sought is a system to allow more chemical to be sprayed from the outer nozzles, to even the application with the more central nozzles.

Reporter Gregory A. Hall can be reached at (302) 582-4087.

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